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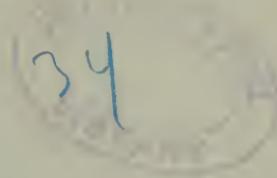
*Memory by Author*

# HOARSENESS AND ITS CAUSES

A LECTURE DELIVERED AT THE GRAND  
CONSERVATORY OF MUSIC, NEW  
YORK, MARCH 29, 1876.

BY  
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ACADEMY OF MEDICINE.



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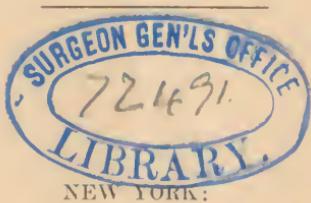
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## HOARSENESS AND ITS CAUSES.

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IN my last lecture I demonstrated the anatomy of the organs of voice, and the manner in which voice is produced.

This evening I shall endeavor to explain the causes and treatment of certain forms of hoarseness or impaired voice common to singers and speakers.

The vocal cords have four sets of muscles. I shall not inflict upon you their long anatomical names, but give the classifications only. *First*, the adductors of the vocal cords, or closers of the glottis; that is to say, the muscles which bring the cords to the median line during vocalization. *Second*, the abductors, those which open the glottis, or separate the cords during inspiration. *Third*, the tensors, which render the cords tight, for the production of the high notes during singing. *Fourth*, the laxors, to antagonize the action of the tensors, or, in other words, relax the cords after their great tension during the production of the high notes.

If, from any cause—we will suppose paralysis—the action of any one of these muscles is impaired, it will, in proportion to the degree of disability, make itself manifest in the voice-producing power of the patient.

There may be complete loss of voice; or mere weakness, as shown in the inability to read aloud for any length of time, or for public speaking; or only slight hoarseness; or nothing wrong may be appreciable in the tone of the voice when used for ordinary conversation, but on attempting to sing, it will be found impossible to ascend or descend the register, from loss of one or more of the lower, middle, or higher notes.

In paralysis of the adductors, or closers, approximation is impossible, and a greater or less space is observed between the cords on attempted phonation.

In paralysis of the little muscle which brings the arytenoid cartilages together, there is a triangular space left between the cords posteriorly. The voice in this variety is not necessarily lost, as the cords meet for at least three-fourths of their length anteriorly.

Neither is voice lost in paralysis of the abductors or openers. This form is very serious in its character, and is liable to terminate in sudden death at any moment; to avoid which the windpipe is generally opened and an artificial tube inserted to enable the patient to breathe.

In paralysis of the tensors, the cords seem to be relaxed and flabby, and to waver in the center upon phonation. If the paralysis is confined to one cord, the plane of the surface or their parallelism is destroyed, because one cord will be tight, or tense, and the other loose, or relaxed; the voice is lowered in tone, and lost for the higher and middle notes in singing.

In paralysis of the laxors the cords appear rigid, and of greater length, the voice is shrill and sharp, with loss of the lower notes in singing.

We will find, however, in some cases, that the laryngoscope reveals nothing abnormal, and the true cause consequently remains in obscurity; particularly is this the case in what is known as hysterical aphonia, which takes place suddenly, and after a longer or shorter period the voice may reappear quite unexpectedly, without the agency of any special treatment. It generally attacks delicate, nervous women, although it is not confined to that sex; it may co-exist with other symptoms or they may be entirely wanting; in some cases there are intermissions, that is, the voice may return only to disappear again, after a brief period, without apparent cause.

We have loss of voice arising from violent emotional causes, as fright, joy, or grief. The cause has its origin in the brain, and not in the apparatus of voice; the same exciting cause which produced it has been known to restore it.

“In a voice husky with emotion,” is a phrase that you frequently see in the sensational novel: for instance, Adolphus throws himself at the feet of his darling Augusta, and in fervid accents declares his love, and implores her to make him happy; she bids him arise and tells him that it can never be, because of circumstances over which she has no control, etc. Adolphus then, in a voice “husky with emotion,” announces his determination to blow his brains

out or commit some other foolish act, and rushes from her presence.

What is the cause of Adolphus' "husky voice?" The voice does not become husky until she tells him "it can never be;" this evidently takes the poor fellow by surprise, the disappointment makes an impression upon his shallow brain, which is conveyed instantly to his heart; the heart becomes violently excited, and his pneumo-gastric nerve is irritated; this irritation extends to the laryngeal recurrent nerve, thence to the vocal cords, a temporary congestion follows, the fine vibrations are interfered with—hence, huskiness of voice.

To be struck "dumb with astonishment," and the nervousness or embarrassment which shows itself in the youthful Cicero or Demosthenes, in the delivering of his maiden speech, can be explained in the same way.

I have frequently observed hoarseness in the early stages of consumption, in which the laryngoscope revealed neither thickening of the mucous membrane nor ulceration.

In other cases, huskiness of the voice is one of the first symptoms of this disease; it arises from thickening of the upper portion of the lung from the tubercular deposit pressing upon the nerve, and by what is known as reflex action, producing paralysis of the adductors on the side corresponding to the affected lung.

Overstraining of the voice by loud talking, reading, public speaking, or singing, by attempting an

unnatural pitch, sometimes results in sudden loss of voice, hoarseness, or inability to sustain it for prolonged effort. In singing, there may be a loss only of one or more of the higher or lower notes.

The difficulty arises from paralysis of the laxors or tensors, in which case there will be insufficient vibratile elasticity of the cords.

The action of these muscles may be exemplified in a very simple manner. While phonating, press with the finger upon the Pomum Adami. The cords are at once relaxed, and the tone of the voice is lowered ; remove the finger and the voice regains the higher key. Pitch of voice, therefore, is brought about by increasing the tension of the vocal cords as well as the blast from the lungs. Too great an effort to sustain this condition may result in an exhaustion of nerve force ; hence, paralysis.

The following case, taken at random from my notebook, illustrates the evil consequences of overstraining the voice in singing, or, in other words, of attempting to accomplish suddenly that which should have been brought about slowly and gradually, and not by the forcing method.

A young lady consulted me at the suggestion of Dr. Marion Sims. She stated that three years ago, after an attack of acute inflammation of the throat, she experienced, while taking her singing lessons, a peculiar dryness of the throat and weakness of the voice as the lesson progressed. She complained to her teacher of the trouble, who, however, urged her to continue singing, insisted on her practicing at least

an hour daily, declaring that "exercise was all that her voice needed." To quote her own language: "He was annoyed when I sang feebly, and said that my singing well at the commencement of the lesson was a proof that I could produce stronger tones if I would exert myself."

At the end of nine months she could no longer trill, and felt that her throat was growing worse.

She discontinued her lessons for nearly a year, and was treated by the physician who had charge of her case during that period, by frequent applications of caustics on a sponge probang.

Considering herself cured, she accepted an engagement in a choir. For a very short time she had but little difficulty in performing her part; but one day, upon being urged by the leader to make a greater effort, severe pain suddenly ensued in her throat, and she fainted. From that time, all voice for singing was lost to her.

An examination with the laryngoscope discovered congestion of the vocal cords, and the whole of the interior of the larynx. Both vocal cords were relaxed. Particularly was this observable upon attempting the middle and higher notes, where the level appearance of their plane seemed to be destroyed.

The trouble in this case, as could be plainly seen, was in the muscles which give tonicity to the cords, or tensors, brought about by overstraining in attempting to reach the higher notes, and also by too prolonged effort. The treatment in this case was tedious,

but very successful. She recovered her voice, and sings without the slightest difficulty.

We are told by Plutarch that Gracchus lost his voice suddenly whilst delivering an oration. I presume, that, like many of the stump orators of the present day, he spoke too long and in too high a key. His tensors became overstrained, and his voice consequently was ruined.

In Shakspeare's King Henry IV. merry Jack Falstaff says, "For my voice I have lost it with hollering, and singing of anthems." I doubt if the jolly old fellow ever sang anthems, and it is more than likely he overstrained the muscles of the cords in singing his bacchanalian songs at midnight orgies.

It would be easy to multiply the instances of loss of voice from excessive use or abuse of it, but our space will not permit.

Prolonged silence has been known to cause loss of voice; instances are on record of nuns, in convents, who, in consequence of the silence imposed upon them by the rules of their order, have become speechless. This can be attributed to want of exercise of the muscles of the cords. In the same way, a person who has sustained a fracture of a leg or thigh and has it tightly bound in splints for weeks, and sometimes months, is unable to use it at first when released. Even although the bone has firmly united, the muscles have wasted very much in size, and, for the time, have entirely lost their function.

The pneumogastric nerve is the large nerve which passes down the side of the neck, just outside of the

great vessels; it sends branches to the larynx, heart, lungs, stomach, and other internal organs. Pressure upon it or any of its branches may, through what is termed reflex action, produce paralysis of the muscles which move the cords. For instance, a goitre, enlarged glands in the neck, enlargement of the great blood-vessels coming from the heart, may produce the trouble.

Enlarged tonsils, so very common, frequently give rise to hoarseness and sometimes to loss of voice. Growths, or small polypi, or tumors, occasionally form in the larynx, most frequently on the cords. In these cases the impairment of voice will depend upon the size and position of the tumor. If it hangs below the cord, there may be only slight hoarseness; if between them, the voice may be altogether lost; if it rests upon the surface of the cord, the change of voice will be slight.

A growth situated upon the free edge of the cord, and hanging below, will be forced upward and between the cords during the production of the high chest and falsetto notes. The glottis will be divided into an anterior and posterior half, and we will have a secondary tone. This phenomenon is not observed during ordinary conversation nor during the singing of the lower notes, the growth is not forced upward and between the cords, and approximation throughout their entire length is not interfered with.

The voice of boys, on arriving at the age of fifteen or sixteen, undergoes a change from the rapid growth and development of the larynx. There may be only

a slight hoarseness, from the normal physiological congestion of the parts, interfering with the fine vibrations of the vocal cords, or the voice may assume and retain a shrill, piping, falsetto tone. An examination of these cases with the laryngoscope will reveal an impairment of action of one of the vocal cords, generally the adductor of the left, which is prevented coming to the median line.

Shakspeare, in his beautiful description of the "Seven Ages of Man," thus refers to the voice in old age :

"—— and his big manly voice,  
Turning again toward childish treble, pipes  
And whistles in his sound."

The trouble here is in paralysis of the muscles which relax the cords, or the antagonizers of the tensors. There is wasting of muscular substance, a deficiency of nerve force, and a want of that vibratile elasticity so necessary for perfect voice.

There are two more causes of hoarseness that I shall refer to, viz., congestion of the windpipe, or what is known as cold; and elongation of the uvula, sometimes improperly called the palate. Congestion of the windpipe generally begins with a sore throat and feverish symptoms, pain in swallowing, sometimes cough. These symptoms will readily yield to simple treatment, and will frequently disappear of themselves in a few days; the hoarseness, however, may remain. An examination with the laryngoscope will reveal a redness of the cords and the surrounding parts; the cords will also appear relaxed and

flabby, covered with a tenacious secretion, and their vibrations interfered with from the puffed and swollen condition of the mucous membrane. If this condition is not relieved, it is very apt to become chronic; the membranes, from being unduly congested and swollen, will become thickened, and the treatment will require a much longer time, and, if neglected, it is liable to extend downward through the windpipe to the lungs and develop a painful bronchitis or a fatal consumption.

The uvula is liable both to enlargement and elongation; it hangs from the center of the soft palate immediately over the epiglottis, which, however, it should never touch. Whenever it does come in contact with that part of the larynx, it acts as a mechanical irritant, keeping it in a state of chronic congestion, which condition extends to the interior of the larynx, and may even reach the bronchi and lungs. From this congestion we have cough, hoarseness, and the unpleasant feeling of something constantly in the throat to be swallowed. In such cases there is but one thing to be done, that is, amputation of the greater portion of it.

The uvula is endowed with very little sensibility and but scantily supplied with blood-vessels; consequently the operation, which occupies but a second of time, is painless and bloodless. Astringent gargles may for the time cause it to retract, but the only permanent and radical cure is the operation.

I have performed it hundreds of times, and have never seen any ill result follow; the effect upon the

voice is to improve it by increasing its clearness, and I have known singers upon whom the operation had been performed declare that they had gained one note higher through it.

In the varieties of loss of voice I have enumerated, I have not referred to the deaf and dumb, which belong to the incurable class, and do not come within the scope of this paper. The want of speech is due to a malformation or an arrest of development of the larynx, and the deafness to a deficiency of the apparatus of hearing, which neither medical nor surgical skill can remedy.

A knowledge of the causes of the most common forms of hoarseness will enable one to avoid it. An athlete, in training for a pedestrian feat, a boat race, sparring match, or any test of muscular strength and endurance, will not allow himself to become fatigued in his daily exercise. A youth just beginning his physical education in the gymnasium is carefully watched by the master, lest ambition should urge him to attempt feats of strength beyond his ability to perform; but he is led onward, step by step, from the easy to the difficult, until at last, when his muscles have acquired that full development, that roundness, firmness, and elasticity which we all admire so much, then, and not till then, is he permitted to attempt such feats as the death-spring, for instance, a failure to accomplish which may result in permanent disability from the overstrain of muscles, a fractured limb, or dislocated joint. Even so should it be in singing; the system of "forcing," so common in

in this and other cities, ruins annually more voices than are developed by it. A good rule for teachers as well as pupils to observe, is, never to fatigue themselves in singing. If you wish to preserve the strength, elasticity, flexibility, and clearness of your voice, first ascertain the time you can sing to commencing fatigue, and afterward always stop short of that point. The vocal cords and muscles of the larynx can be developed and strengthened by constant and judicious exercise, just as the biceps and deltoid of the blacksmith are by the constant swinging of his hammer.

In cases of inflammation or congestion of the cords and surrounding parts in the larynx, and of those varieties of paralysis I have described as arising from strain, rest of voice, above all other things, is necessary, even as much so for recovery as it is for the sprained ankle or wrist, or a dislocated joint after reduction, or for eyes that are weak from inflammation.

For the medical treatment, astringent applications by means of a camel's hair brush to the vocal cords, soothing inhalations of medicated steam or vapor, astringent lozenges, etc.

In the treatment of paralysis, electricity should be applied. This agent is not new in the treatment of loss of voice. In the year 1800, Grapengriem of Berlin applied it to the neck; but to Dr. Mackenzie, of London, my preceptor, belongs the credit of having first applied it to the mucous membrane of the larynx, directly over the paralyzed muscles. A band is fastened around the neck, to which one pole is attached over the thyroid cartilage, the other to a

metallic rod bent at the proper curve and passed over the epiglottis into the larynx by aid of the laryngoscope. One application, thoroughly made, will sometimes restore a lost voice of many months' standing.

If the loss of voice depends upon a growth or tumor on either of the cords, it must be removed by instruments introduced through the mouth and into the larynx by aid of the laryngoscope; the operation is delicate and difficult, but is frequently done with success.

The wearing of the beard is an excellent preventive of throat affections, and a learned authority states that since the clergy in England have thrown aside their foolish prejudices against the hirsute appendage, there has been a notable decrease in the percentage of throat diseases among them.

Ladies who value the voice and desire to preserve it for song, in lieu of the protection nature has supplied to man—the beard—should keep the throat well protected by clothing against the changes of weather, particularly during our winter season. Daily bathing the neck with cold water will render one less susceptible to the vagaries of our fickle climate.

The respirator, consisting of fine wire gauze, and covered with silk or velvet, is an excellent protection; it should be worn during the winter season, especially at night, upon going into the cold air from theaters and other places of amusement; it is a good substitute for the mustache, and tempers the cold air before it enters the lungs, even as it is tempered for the “shorn lamb.”





